

Tennessee Pollution Prevention Partnership Success Story



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Cougars Count Kilowatts

The Member

Centennial High School's Environmental Science classes, under the direction of Jeff Taylor, perform hands-on projects inside and outside the school. Through these projects, the classes learn about the environment and human impacts on the environment. The classes are broken down into 12 student-lead teams. Each team has specific environmental goals, such as recycling, litter pick-up, erosion control, research, public relations, the greenhouse, campus beautification, energy conservation, and the pond. These teams identify and work toward their goals all year to create a better environment on campus and in the local community.

The Story

With the task of energy conservation, the students first brainstormed a long list of everything in the school that uses electricity. The students then performed a comprehensive energy audit of the school, consisting of building age, building materials, building orientation, energy types used, energy costs, current building energy usage, energy management systems, maintenance, high-demand systems (water heaters, heating/air conditioning, lighting), recycling, appliances, bathrooms, cafeteria, insulation, doors and windows. In 2000/2001 the school district installed the energy management system with setback thermostats for night, weekend, and vacation savings and 6-degree temperature ranges; retrofitted all overhead lights to T-8 bulbs with electronic ballasts; and replaced all exit signs with LED Exit Signs.

However, the students found more ways to conserve energy and decided to start an Energy Patrol. First, they set a goal for the school to reduce energy consumption by 2%, developed procedures for the patrollers, obtained support and approval from the principal and the Building Leadership Team, and gave a 30-minute power point presentation to the faculty, informing them about the goals and the importance of energy conservation. The Energy Patrol checks for computers and TVs left on, faucets leaking, especially hot water, and lights left on in empty rooms. Patrolling was done during students' study periods and one walk-through after school per week. During the after-school walk-through, one of the students identified lights on vending machines as a potential focus for change. The students also found nine desk lamps that had 60-100W incandescent bulbs burning 24 hours per day, 7 days per week. Exterior lights for the building were operating on a time clock and had to be manually reset for daylight savings time and power outages, so they got these lights attached to the energy management system for total automation of the lights. In addition to gathering all their patrol information, they educated other

students and staff about reporting faucet leaks, shutting off lights, and not leaving outside windows and doors open. The students wrote PTSO newsletter articles, informing parents about the need for energy conservation and giving suggestions for their homes. Students updated the faculty once a month on the progress of the patrol and ways to continue improvements. Energy Patrol progress is also on the Centennial High School web site.

The Success

Students and staff learned why we should conserve energy and some ways to do it. The Energy Patrol stayed on top of needed maintenance repairs for leaking faucets. The first month, the Patrol saved 1,428 kwh by turning off lights after school and uncalculated amounts by turning off computer monitors and TVs. Electricity costs \$.04/kwh. By retrofitting nine desk lamps to compact fluorescents, we will now save 1,987 kwh per year, and \$80/year. Students have agreement from the vending machine company to have all the lights turned off in the 23 cold-drink vending machines and to educate the student body that machines are still working if lights are off. They are looking at a possible savings of 25,060 kwh per year school-wide, totaling \$1,002/year in costs avoided from vending machine lights.

The Pollution Prevented

The students made a spreadsheet to record how many lights, monitors, and TVs were turned off during one month. School energy awareness improved, as indicated by the 20% decrease in the number of wasted kilowatt-hours after the first month of Energy Patrol. Over the course of a year, the students expect to conserve at least 27,047 kwh from changing lamps to compact fluorescents and turning off vending machine lights, saving \$1082/year. With the Energy Patrol's daily efforts, savings will be even greater. It takes one pound of coal to make each kwh of electricity, so we will save at least 27,047 pounds of coal.

In Tennessee, coal-fired power plants are a significant source of air pollution. With the energy saved from retrofitting light bulbs and turning off vending machine lights, we will prevent 59,503 lbs of Carbon Dioxide, 157 lbs of Nitrogen Oxides and 313 lbs of Sulfur Dioxide emissions each year. Those prevented emissions are equivalent to taking 6.0 cars off the highway or planting 8 acres of trees. With Tennessee using coal as its primary source of energy, the students were able to save on a non-renewable resource and execute good stewardship towards the environment by minimizing the amount of energy wasted and pollution created.

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